

2.5 - Continuity and 2.6 - Trig functions

2014-09-22 day 19

1) what are you scared of?

2) what you think you understand  
class specific

what you think you are confused about

class specific

3) how do you feel about you and your effort

class specific

4) what do you think I should/could do differently to help you?

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## Trig things



opposite

$$\frac{opp_2}{opp_1} = \frac{hyp_2}{hyp_1}$$

$$\frac{opp_2}{hyp_2} = \frac{opp_1}{hyp_1}$$

## Memorize

$$\sin x = \frac{\text{opp}}{\text{hyp}}$$

$$\cos X = \frac{\text{adj}}{\text{hyp}}$$

$$\tan x = \frac{\text{opp}}{\text{adj}}$$

right triangles  
(start)

## similar triangles

SSS = 2  $\Delta$ s sides are in the ratio

SAS - sides in same ratio

$$A \setminus (A) =$$

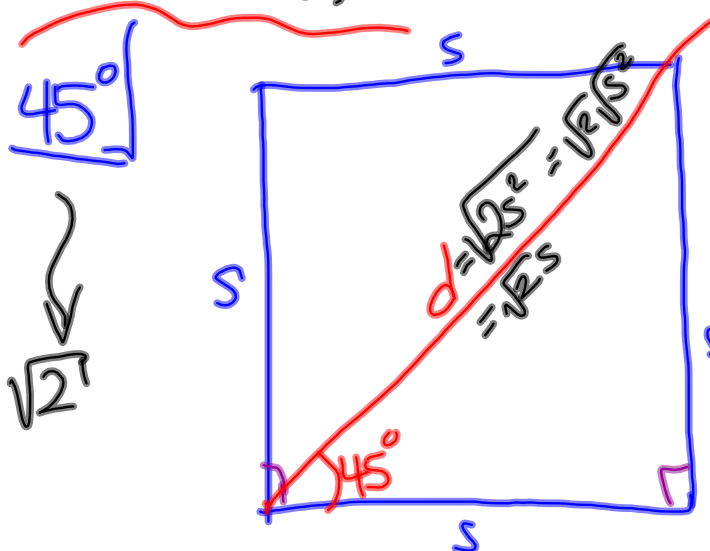
right  $\Delta$

$$a^2 + b^2 = c^2$$

C is opposite the  $90^\circ$  angle

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Special  $\Delta$ s - need to know (e Alexa-13e) $\sin \theta, \cos \theta, \tan \theta$  of $30^\circ (\frac{\pi}{6}), 45^\circ (\frac{\pi}{4}), 60^\circ (\frac{\pi}{3})$ 

$$\sin 45^\circ = \frac{\text{opp}}{\text{hyp}}$$

$$\frac{s}{d} = \frac{s}{\sqrt{2}s} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$\cos 45^\circ = \frac{\text{adj}}{\text{hyp}}$$

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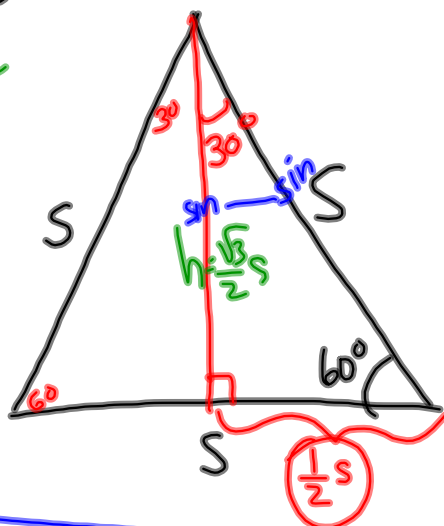
$$d^2 = s^2 + s^2 = 2s^2$$

$$\frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{(\sqrt{2})^2} = \frac{\sqrt{2}}{2}$$

$$\tan 45^\circ = \frac{\text{opp}}{\text{adj}} = \frac{s}{s} = 1$$

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 $30^\circ - 60^\circ - 90^\circ$  $\sqrt{3}$ 

P.T.O

$$h^2 + \left(\frac{1}{2}S\right)^2 = S^2$$

$$h^2 + \frac{S^2}{4} = S^2$$

$$-\frac{S^2}{4} \quad -\frac{S^2}{4}$$

$$h^2 = \left(1 - \frac{1}{4}\right)S^2 = \frac{3}{4}S^2$$

$$h = \frac{\sqrt{3}}{2}S = \frac{\sqrt{3}}{2}S$$

$$\left\{ \begin{array}{l} \sin 60^\circ \\ \cos 30^\circ \end{array} \right\} = \frac{h}{S} = \frac{\frac{\sqrt{3}}{2}S}{S} = \frac{\sqrt{3}}{2}$$

$$\left\{ \begin{array}{l} \sin 30^\circ \\ \cos 60^\circ \end{array} \right\} = \frac{\frac{1}{2}S}{S} = \frac{1}{2}$$

$$\tan 60^\circ = \frac{\sqrt{3}/2}{1/2} = \sqrt{3}$$

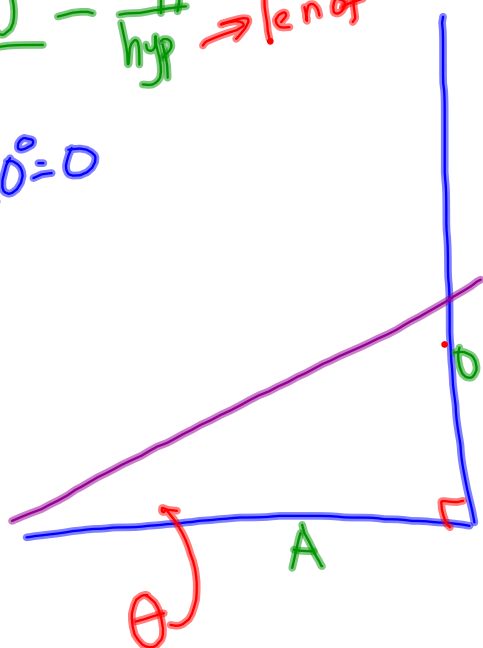
$$\tan 30^\circ = \frac{1/2}{\sqrt{3}/2} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$

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$$\sin 90^\circ = \frac{\text{opp}}{\text{hyp}} \rightarrow \text{len of purple} = 1$$

$$\cos 90^\circ = 0$$



$$\sin 0 = \frac{\text{opp}}{\text{hyp}} \rightarrow 0$$

stays purple (the same)

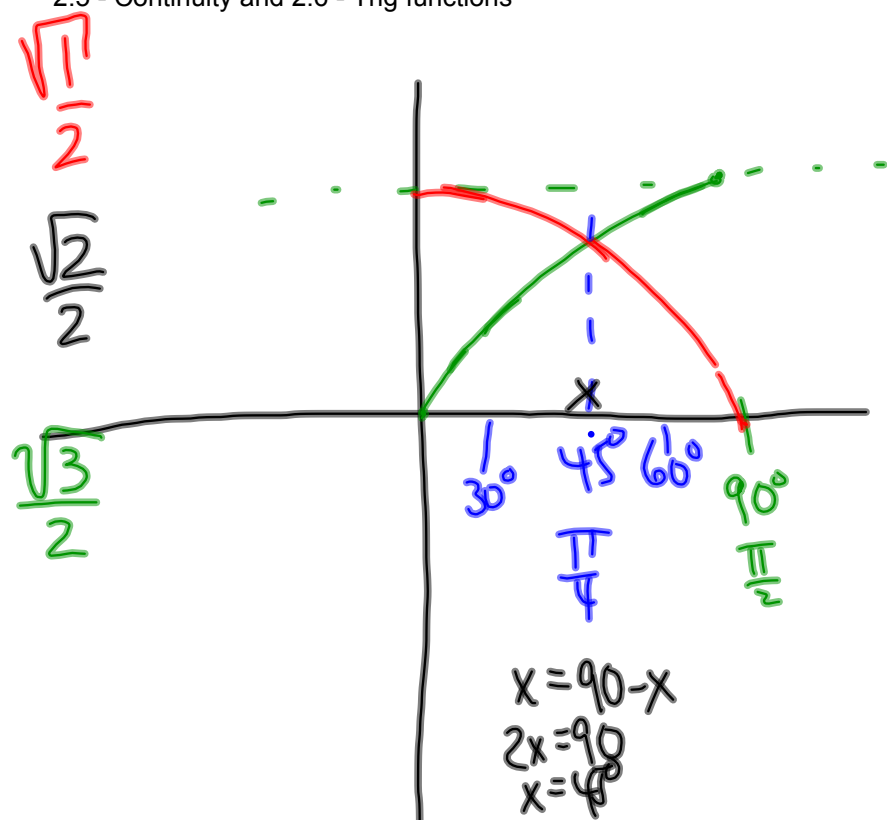
$$\cos 0 =$$

$$\frac{\text{"adj"}}{\text{hyp}} \rightarrow \text{length of purple line} = 1$$

length of purple

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sin  
 $= \cos(\text{complement of } x)$

cos  
 $= \sin(\text{complement of } x)$

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$$\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$$

try substituting  
in this

$\frac{0}{0}$  indeterminate  
form

$$0 < \frac{\sin x}{x} < 1 \quad \text{for small } x$$

$= 1$  as  $x \rightarrow 0$

An AP regmt  
answers must be correct  
to 3 decimal  
places

what does  $\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$  mean

for small values of  $x$ , [in radians]

$$x \approx \sin x$$

$$20 \cdot \frac{\pi}{180}$$